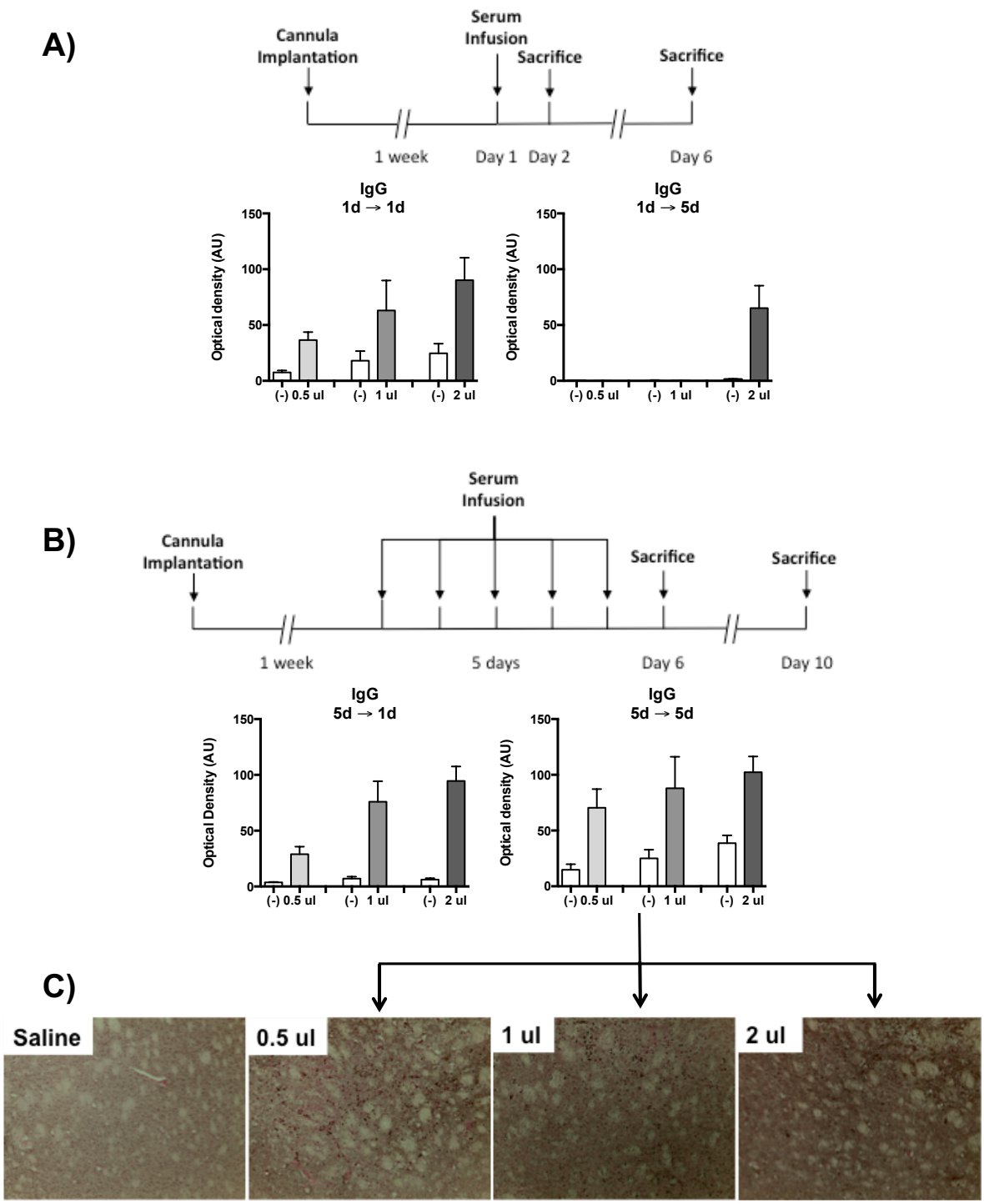
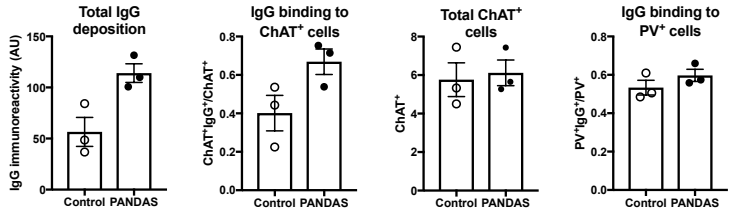
Supplementary Figure #1.

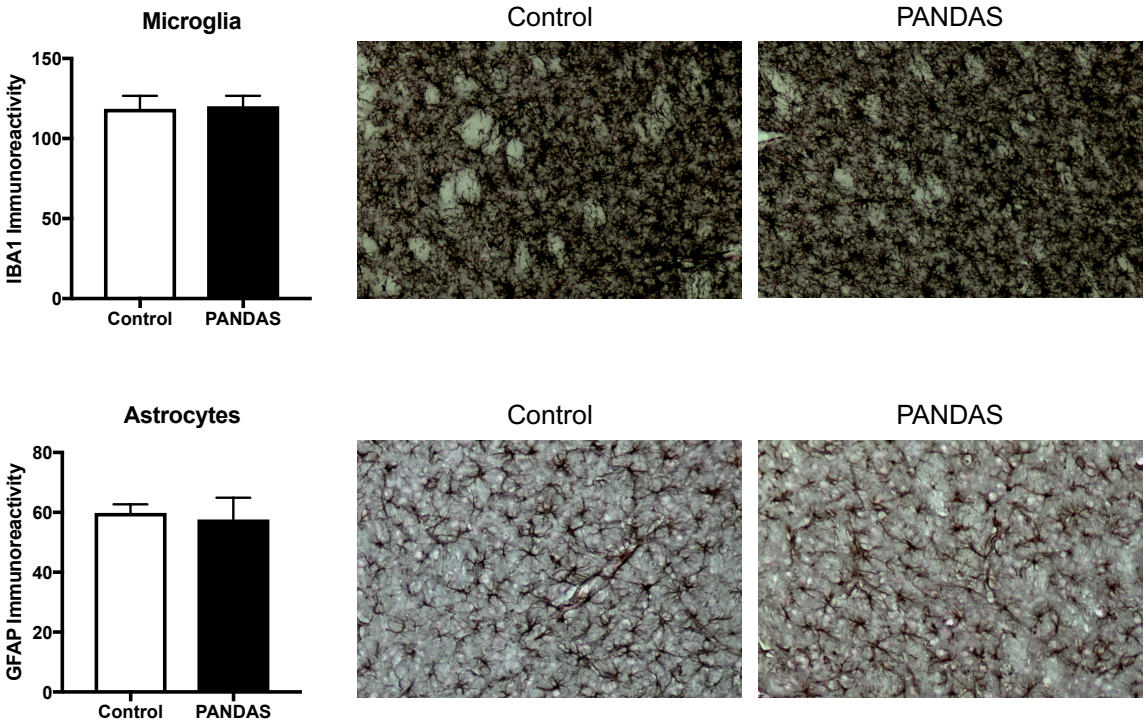


Supplementary Figure 1. Optimization of serum infusion protocol. Characterization of cell-type specific antibody binding require clear binding to cell bodies with low background. We varied infusion parameters with purchased serum to optimize assay parameters. **A.** First, we infused different volumes of serum (0.5, 1, or 2 µl) into striatum a single time, and sacrificed animals 1 or 5 days later. Antibody deposition was observed 1 day later but was diffuse (not shown). Antibody deposition, again diffuse, was observed 5 days later only with the maximum volume of infused serum. **B.** Next, we infused serum daily for 5 days, and sacrificed mice 1 or 5 days later. Antibody deposition was observed both 1 and 5 days after serum infusion at all infused volumes. **C.** Optimal cell-body labeling with low background was seen 5 days after repeated infusion of a low volume of serum (0.5 µl). Infusion of larger serum volume led to more diffuse staining. We therefore selected these parameters – 0.5 µl serum infusion x 5 days, with sacrifice 5 days following final serum infusion – for all subsequent experiments.

Subject	*Sex*	*Age*	*Race/Ethnicity*	*Baseline CY-BOCS*	*Baseline IgG (mg/dL)*	*ANA*
PANDAS						
A	F	12.3	W/NH	23	1190	+
B/3	*F*	*6.7*	*W/NH*	*27*	*1160*	*+*
C	M	7.7	W/NH	22	1290	+
Control						
A	M	11	N/A	-	N/A	N/A
B	F	11	N/A	-	N/A	N/A
C	F	8	N/A	-	N/A	N/A



Supplementary Figure 2. Pilot experiment. In a pilot experiment, serum from three subjects with PANDAS and three matched controls was infused into the dorsal striatum of mice over five days, following the protocol developed as described in Supplementary Figure 1. Mice we sacrificed 5 days after the final infusion; brains were fixed, sliced, and immunostained for human IgG, ChAT, and parvalbumin. Human IgG binding to ChAT-positive interneurons in the dorsal striatum was elevated after infusion of serum from children with PANDAS, relative to matched healthy controls; the total number of ChAT-positive cells was unchanged, as was IgG binding to PV-positive GABAergic interneurons. This pilot experiment motivated a larger replication experiment with carefully selected PANDAS samples, as described in the main text. N = 2-3 mice for each of 3 sera per group.



Supplementary Figure 3. Sections from the pilot experiment described in Supplementary Figure 2 were immunostained for Iba1, a marker of microglia (top panels), and for GFAP, a marker of astrocytes (bottom panels). Immnoreactivity was quantified using ImageJ as described previously by Frick et al, *BBI* 2016. While both microglial and astrocyte staining were increased relative to naïve mice, showing reactive changes to surgery and/or to the infusion of serum, there were no qualitative or quantitative differences between control and PANDAS serum infusions. N = 2-3 mice for each of 3 sera per group.